

SEQUENCE LISTING

<110> Matsumoto et al.

<120> NOVEL GUANOSINE TRIPHOSPHATE-BINDING PROTEIN-COUPLED RECEPTORS AND GENES THEREOF, AND PRODUCTION AND USES THEREOF

<130> 62514

<140>

<141>

<150> PCT/JP00/09408

<151> 2000-12-28

<150> JP 1999-375152

<151> 1999-12-28

<150> JP 2000-101339

<151> 2000-03-31

<160> 63

<170> PatentIn Ver. 2.1

<210> 1

<211> 371

<212> PRT

<213> Homo sapiens

<400> 1

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Thr Glu Val Val Glu Gly Lys Glu Trp Gly Ser Phe Tyr Tyr Ser Phe
    35              40              45

Lys Thr Glu Gln Leu Ile Thr Leu Trp Val Leu Phe Val Phe Thr Ile
    50              55              60

Val Gly Asn Ser Val Val Leu Phe Ser Thr Trp Arg Arg Lys Lys Lys
    65              70              75              80

Ser Arg Met Thr Phe Phe Val Thr Gln Leu Ala Ile Thr Asp Ser Phe
      85              90              95

Thr Gly Leu Val Asn Ile Leu Thr Asp Ile Asn Trp Arg Phe Thr Gly
    100              105              110

Asp Phe Thr Ala Pro Asp Leu Val Cys Arg Val Val Arg Tyr Leu Gln
    115              120              125
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Val Val Leu Leu Tyr Ala Ser Thr Tyr Val Leu Val Ser Leu Ser Ile
 130 135 140
 Asp Arg Tyr His Ala Ile Val Tyr Pro Met Lys Phe Leu Gln Gly Glu
 145 150 155 160
 Lys Gln Ala Arg Val Leu Ile Val Ile Ala Trp Ser Leu Ser Phe Leu
 165 170 175
 Phe Ser Ile Pro Thr Leu Ile Ile Phe Gly Lys Arg Thr Leu Ser Asn
 180 185 190
 Gly Glu Val Gln Cys Trp Ala Leu Trp Pro Asp Asp Ser Tyr Trp Thr
 195 200 205
 Pro Tyr Met Thr Ile Val Ala Phe Leu Val Tyr Phe Ile Pro Leu Thr
 210 215 220
 Ile Ile Ser Ile Met Tyr Gly Ile Val Ile Arg Thr Ile Trp Ile Lys
 225 230 235 240
 Ser Lys Thr Tyr Glu Thr Val Ile Ser Asn Cys Ser Asp Gly Lys Leu
 245 250 255
 Cys Ser Ser Tyr Asn Arg Gly Leu Ile Ser Lys Ala Lys Ile Lys Ala
 260 265 270
 Ile Lys Tyr Ser Ile Ile Ile Ile Leu Ala Phe Ile Cys Cys Trp Ser
 275 280 285
 Pro Tyr Phe Leu Phe Asp Ile Leu Asp Asn Phe Asn Leu Leu Pro Asp
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 Thr Gln Glu Arg Phe Tyr Ala Ser Val Ile Ile Gln Asn Leu Pro Ala
 305 310 315 320
 Leu Asn Ser Ala Ile Asn Pro Leu Ile Tyr Cys Val Phe Ser Ser Ser
 325 330 335
 Ile Ser Phe Pro Cys Arg Glu Gln Arg Ser Gln Asp Ser Arg Met Thr
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 Phe Arg Glu Arg Thr Glu Arg His Glu Met Gln Ile Leu Ser Lys Pro
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 Glu Phe Ile
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<210> 2
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Ser Ala Glu Leu Arg Thr Arg Ala Ser Gly Val Leu Leu Val Asn Leu	35	40	45
Ser Leu Gly His Leu Leu Leu Ala Ala Leu Asp Met Pro Phe Thr Leu	50	55	60
Leu Gly Val Met Arg Gly Arg Thr Pro Ser Ala Pro Gly Ala Cys Gln	65	70	75
Val Ile Gly Phe Leu Asp Thr Phe Leu Ala Ser Asn Ala Ala Leu Ser	85	90	95
Val Ala Ala Leu Ser Ala Asp Gln Trp Leu Ala Val Gly Phe Pro Leu	100	105	110
Arg Tyr Ala Gly Arg Leu Arg Pro Arg Tyr Ala Gly Leu Leu Leu Gly	115	120	125
Cys Ala Trp Gly Gln Ser Leu Ala Phe Ser Gly Ala Ala Leu Gly Cys	130	135	140
Ser Trp Leu Gly Tyr Ser Ser Ala Phe Ala Ser Cys Ser Leu Arg Leu	145	150	155
Pro Pro Glu Pro Glu Arg Pro Arg Phe Ala Ala Phe Thr Ala Thr Leu	165	170	175
His Ala Val Gly Phe Val Leu Pro Leu Ala Val Leu Cys Leu Thr Ser	180	185	190
Leu Gln Val His Arg Val Ala Arg Arg His Cys Gln Arg Met Asp Thr	195	200	205
Val Thr Met Lys Ala Leu Ala Leu Leu Ala Asp Leu His Pro Ser Val	210	215	220
Arg Gln Arg Cys Leu Ile Gln Gln Lys Arg Arg Arg His Arg Ala Thr	225	230	235
Arg Lys Ile Gly Ile Ala Ile Ala Thr Phe Leu Ile Cys Phe Ala Pro	245	250	255
Tyr Val Met Thr Arg Leu Ala Glu Leu Val Pro Phe Val Thr Val Asn	260	265	270
Ala Gln Trp Gly Ile Leu Ser Lys Cys Leu Thr Tyr Ser Lys Ala Val	275	280	285
Ala Asp Pro Phe Thr Tyr Ser Leu Leu Arg Arg Pro Phe Arg Gln Val	290	295	300

Leu Ala Gly Met Val His Arg Leu Leu Lys Arg Thr Pro Arg Pro Ala
305 310 315 320

Ser Thr His Asp Ser Ser Leu Asp Val Ala Gly Met Val His Gln Leu
325 330 335

Leu Lys Arg Thr Pro Arg Pro Ala Ser Thr His Asn Gly Ser Val Asp
340 345 350

Thr Glu Asn Asp Ser Cys Leu Gln Gln Thr His
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<210> 3

<211> 419

<212> PRT

<213> Homo sapiens

<400> 3

Met Leu Ala Ala Ala Phe Ala Asp Ser Asn Ser Ser Ser Met Asn Val
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Ser Phe Ala His Leu His Phe Ala Gly Gly Tyr Leu Pro Ser Asp Ser
20 25 30

Gln Asp Trp Arg Thr Ile Ile Pro Ala Leu Leu Val Ala Val Cys Leu
35 40 45

Val Gly Phe Val Gly Asn Leu Cys Val Ile Gly Ile Leu Leu His Asn
50 55 60

Ala Trp Lys Gly Lys Pro Ser Met Ile His Ser Leu Ile Leu Asn Leu
65 70 75 80

Ser Leu Ala Asp Leu Ser Leu Leu Leu Phe Ser Ala Pro Ile Arg Ala
85 90 95

Thr Ala Tyr Ser Lys Ser Val Trp Asp Leu Gly Trp Phe Val Cys Lys
100 105 110

Ser Ser Asp Trp Phe Ile His Thr Cys Met Ala Ala Lys Ser Leu Thr
115 120 125

Ile Val Val Val Ala Lys Val Cys Phe Met Tyr Ala Ser Asp Pro Ala
130 135 140

Lys Gln Val Ser Ile His Asn Tyr Thr Ile Trp Ser Val Leu Val Ala
145 150 155 160

Ile Trp Thr Val Ala Ser Leu Leu Pro Leu Pro Glu Trp Phe Phe Ser
165 170 175

Thr Ile Arg His His Glu Gly Val Glu Met Cys Leu Val Asp Val Pro
180 185 190

Ala Val Ala Glu Glu Phe Met Ser Met Phe Gly Lys Leu Tyr Pro Leu

195	200	205
Leu Ala Phe Gly Leu Pro Leu Phe Phe Ala Ser Phe Tyr Phe Trp Arg 210 215 220		
Ala Tyr Asp Gln Cys Lys Lys Arg Gly Thr Lys Thr Gln Asn Leu Arg 225 230 235 240		
Asn Gln Ile Arg Ser Lys Gln Val Thr Val Met Leu Leu Ser Ile Ala 245 250 255		
Ile Ile Ser Ala Val Leu Trp Leu Pro Glu Trp Val Ala Trp Leu Trp 260 265 270		
Val Trp His Leu Lys Ala Ala Gly Pro Ala Pro Pro Gln Gly Phe Ile 275 280 285		
Ala Leu Ser Gln Val Leu Met Phe Ser Ile Ser Ser Ala Asn Pro Leu 290 295 300		
Ile Phe Leu Val Met Ser Glu Glu Phe Arg Glu Gly Leu Lys Gly Val 305 310 315 320		
Trp Lys Trp Met Ile Thr Lys Lys Pro Pro Thr Val Ser Glu Ser Gln 325 330 335		
Glu Thr Pro Ala Gly Asn Ser Glu Gly Leu Pro Asp Lys Val Pro Ser 340 345 350		
Pro Glu Ser Pro Ala Ser Ile Pro Glu Lys Glu Lys Pro Ser Ser Pro 355 360 365		
Ser Ser Gly Lys Gly Lys Thr Glu Lys Ala Glu Ile Pro Ile Leu Pro 370 375 380		
Asp Val Glu Gln Phe Trp His Glu Arg Asp Thr Val Pro Ser Val Gln 385 390 395 400		
Asp Asn Asp Pro Ile Pro Trp Glu His Glu Asp Gln Glu Thr Gly Glu 405 410 415		
Gly Val Lys		

<210> 4

<211> 393

<212> PRT

<213> Homo sapiens

<400> 4

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20 25 30

Phe Pro Phe Asn Phe Ser Tyr Ser Asp Tyr Asp Met Pro Leu Asp Glu
 35 40 45
 Asp Glu Asp Val Thr Asn Ser Arg Thr Phe Phe Ala Ala Lys Ile Val
 50 55 60
 Ile Gly Met Ala Leu Val Gly Ile Met Leu Val Cys Gly Ile Gly Asn
 65 70 75 80
 Phe Ile Phe Ile Ala Ala Leu Val Arg Tyr Lys Lys Leu Arg Asn Leu
 85 90 95
 Thr Asn Leu Leu Ile Ala Asn Leu Ala Ile Ser Asp Phe Leu Val Ala
 100 105 110
 Ile Val Cys Cys Pro Phe Glu Met Asp Tyr Tyr Val Val Arg Gln Leu
 115 120 125
 Ser Trp Glu His Gly His Val Leu Cys Thr Ser Val Asn Tyr Leu Arg
 130 135 140
 Thr Val Ser Leu Tyr Val Ser Thr Asn Ala Leu Leu Ala Ile Ala Ile
 145 150 155 160
 Asp Arg Tyr Leu Ala Ile Val His Pro Leu Arg Pro Arg Met Lys Cys
 165 170 175
 Gln Thr Ala Thr Gly Leu Ile Ala Leu Val Trp Thr Val Ser Ile Leu
 180 185 190
 Ile Ala Ile Pro Ser Ala Tyr Phe Thr Thr Glu Thr Val Leu Val Ile
 195 200 205
 Val Lys Ser Gln Glu Lys Ile Phe Cys Gly Gln Ile Trp Pro Val Asp
 210 215 220
 Gln Gln Leu Tyr Tyr Lys Ser Tyr Phe Leu Phe Ile Phe Gly Ile Glu
 225 230 235 240
 Phe Val Gly Pro Val Val Thr Met Thr Leu Cys Tyr Ala Arg Ile Ser
 245 250 255
 Arg Glu Leu Trp Phe Lys Ala Val Pro Gly Phe Gln Thr Glu Gln Ile
 260 265 270
 Arg Lys Arg Leu Arg Cys Arg Arg Lys Thr Val Leu Val Leu Met Cys
 275 280 285
 Ile Leu Thr Ala Tyr Val Leu Cys Trp Ala Pro Phe Tyr Gly Phe Thr
 290 295 300
 Ile Val Arg Asp Phe Phe Pro Thr Val Phe Val Lys Glu Lys His Tyr
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cccttcacgc	tgctcggtgt	gatgcgcggg	cggacaccgt	cggcgcccg	cgcattgcaa	240	
gtcattggct	tcttggaac	cttctggcg	tccaacgcgt	cgtcgagcgt	ggcggcgctg	300	
agcgcagacc	agtggctggc	agtgggcttc	ccactgcgct	acgcgggacg	cctgcgacgc	360	
cgcatggcgg	gcctgctgct	gggctgtgcc	tggggacagt	cgtcggcctt	ctcaggcgct	420	
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tccacccatg acagctctct ggatgtggcc ggcatggtgc accagctgct gaagagaacc 1020
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<210> 7
<211> 1260
<212> DNA
<213> Homo sapiens

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gctctcttgg tggtgtcttg cctggtgggc ttcgtgggaa acctgtgtgt gattggcatc 180
ctccttcaca atgcttgga aggaaagcca tccatgatcc actccctgat tctgaatctc 240
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aaaagtgttt gggatctagg ctggtttgtc tgcaagtcct ctgactgggt tatccacaca 360
tgcatggcag ccaagagcct gacaatcgtt gtggtggcca aagtatgctt catgtatgca 420
agtgacccag ccaagcaagt gagtatccac aactacacca tctggtcagt gctggtggcc 480
atctggactg tggctagcct gttacccctg ccggaatggt tctttagcac catcaggcat 540
catgaagggt tggaatgtg cctcgtggat gtaccagctg tggctgaaga gtttatgtcg 600
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ggcaactcag agggctcttc tgacaagggt ccactctccag aatccccagc atccatacca 1080
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cccatccttc ctgacgtaga gcagttttgg catgagaggg acacagtccc tctgtacag 1200
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<210> 8
<211> 1182
<212> DNA
<213> Homo sapiens

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tctgtgctca accctcatgg agcccagtc acttccttcc cattcaactt cagctacagc 120
gactatgata tgccttttga tgaagatgag gatgtgacca attccaggac gttctttgct 180
gccaaagatt tcattgggat ggccctggtg ggcatcatgc tggctctgcg catttgaaac 240
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atcgccaacc tggcatctc tgacttcctg gtggccattg tctgctgccc ctttgatgatg 360
gactactatg tggctgcgca gctctcctgg gagcacggcc acgtcctgtg cacctctgtc 420
aactacctgc gcactgtctc tctctatgtc tccaccaatg ccctgctggc catcgccatt 480

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accaccgaga	cggtcctcgt	cattgtcaag	agccaggaaa	agatcttctg	cggccagatc	660
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tacggcttca	ccatcgtgcg	cgacttcttc	cccaccgtgt	ttgtgaagga	gaagcactac	960
ctcactgcct	tctacatcgt	cgagtgcatc	gccatgagca	acagcatgat	caacactctg	1020
tgcttcgtga	ccgtcaagaa	cgcacacgtc	aagtacttca	aaaagatcat	gttgctccac	1080
tggaaagctt	cttacaattg	cgctaagttc	agtgctagacc	tggaacctca	gacaattggg	1140
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<210> 9
<211> 28
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 9
atgccagcca acttcacaga gggcagct 28

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<210> 10
<211> 28
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 10
ctagatgaat tctggcttgg acagaatc 28

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<210> 11
<211> 28
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence:an artificially
      synthesized primer sequence
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<400> 11
atgggccccg gcgagggcgt gctggcgg 28

$\langle 210 \rangle$	12
$\langle 211 \rangle$	28
$\langle 212 \rangle$	DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 12

tcagtgtgtc tgctgcaggc aggaatca

28

<210> 13

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 13

atgctggcag ctgcctttgc agactctaac

30

<210> 14

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 14

ctatttaaca ctttcccctg tctcttgatc

30

<210> 15

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 15

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28

<210> 16

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially

synthesized primer sequence

<400> 16

ttatttttagt ctgatgcagt ccacctcttc

30

<210> 17

<211> 434

<212> PRT

<213> Homo sapiens

<400> 17

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Ser	Val	Pro	Ile	Leu	Leu	Gly	Trp	Gly	Leu	Asn	Leu	Thr	Leu	Gly	Gln
			20					25					30		

Gly	Ala	Pro	Ala	Ser	Gly	Pro	Pro	Ser	Arg	Arg	Val	Arg	Leu	Val	Phe
		35					40					45			

Leu	Gly	Val	Ile	Leu	Val	Val	Ala	Val	Ala	Gly	Asn	Thr	Thr	Val	Leu
	50					55					60				

Cys	Arg	Leu	Cys	Gly	Gly	Gly	Gly	Pro	Trp	Ala	Gly	Pro	Lys	Arg	Arg
65					70					75					80

Lys	Met	Asp	Phe	Leu	Leu	Val	Gln	Leu	Ala	Leu	Ala	Asp	Leu	Tyr	Ala
				85					90					95	

Cys	Gly	Gly	Thr	Ala	Leu	Ser	Gln	Leu	Ala	Trp	Glu	Leu	Leu	Gly	Glu
			100					105					110		

Pro	Arg	Ala	Ala	Thr	Gly	Asp	Leu	Ala	Cys	Arg	Phe	Leu	Gln	Leu	Leu
		115					120					125			

Gln	Ala	Ser	Gly	Arg	Gly	Ala	Ser	Ala	His	Leu	Val	Val	Leu	Ile	Ala
	130					135					140				

Leu	Glu	Arg	Arg	Arg	Ala	Val	Arg	Leu	Pro	His	Gly	Arg	Pro	Leu	Pro
145					150					155					160

Ala	Arg	Ala	Leu	Ala	Ala	Leu	Gly	Trp	Leu	Leu	Ala	Leu	Leu	Leu	Ala
				165					170					175	

Leu	Pro	Pro	Ala	Phe	Val	Val	Arg	Gly	Asp	Ser	Pro	Ser	Pro	Leu	Pro
			180					185						190	

Pro	Pro	Pro	Pro	Pro	Thr	Ser	Leu	Gln	Pro	Gly	Ala	Pro	Pro	Ala	Ala
		195					200					205			

Arg	Ala	Trp	Pro	Gly	Gln	Arg	Arg	Cys	His	Gly	Ile	Phe	Ala	Pro	Leu
	210					215					220				

Pro	Arg	Trp	His	Leu	Gln	Val	Tyr	Ala	Phe	Tyr	Glu	Ala	Val	Ala	Gly
225					230					235					240

Phe Val Ala Pro Val Thr Val Leu Gly Val Ala Cys Gly His Leu Leu
245 250 255

Ser Val Trp Trp Arg His Arg Pro Gln Ala Pro Ala Ala Ala Ala Pro
260 265 270

Trp Ser Ala Ser Pro Gly Arg Ala Pro Ala Pro Ser Ala Leu Pro Arg
275 280 285

Ala Lys Val Gln Ser Leu Lys Met Ser Leu Leu Leu Ala Leu Leu Phe
290 295 300

Val Gly Cys Glu Leu Pro Tyr Phe Ala Ala Arg Leu Ala Ala Ala Trp
305 310 315 320

Ser Ser Gly Pro Ala Gly Asp Trp Glu Gly Glu Gly Leu Ser Ala Ala
325 330 335

Leu Arg Val Val Ala Met Ala Asn Ser Ala Leu Asn Pro Phe Val Tyr
340 345 350

Leu Phe Phe Gln Ala Gly Asp Cys Arg Leu Arg Arg Gln Leu Arg Lys
355 360 365

Arg Leu Gly Ser Leu Cys Cys Ala Pro Gln Gly Gly Ala Glu Asp Glu
370 375 380

Glu Gly Pro Arg Gly His Gln Ala Leu Tyr Arg Gln Arg Trp Pro His
385 390 395 400

Pro His Tyr His His Ala Arg Arg Glu Pro Leu Asp Glu Gly Gly Leu
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Arg Pro Pro Pro Pro Arg Pro Arg Pro Leu Pro Cys Ser Cys Glu Ser
420 425 430

Ala Phe

<210> 18
<211> 451
<212> PRT
<213> Homo sapiens

<400> 18
Met Glu Ser Ser Pro Ile Pro Gln Ser Ser Gly Asn Ser Ser Thr Leu
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20 25 30

Glu Val Gly Leu Arg Asp Val Ala Ser Glu Ser Val Ala Leu Phe Phe
35 40 45

Met Leu Leu Leu Asp Leu Thr Ala Val Ala Gly Asn Ala Ala Val Met
 50 55 60
 Ala Val Ile Ala Lys Thr Pro Ala Leu Arg Lys Phe Val Phe Val Phe
 65 70 75 80
 His Leu Cys Leu Val Asp Leu Leu Ala Ala Leu Thr Leu Met Pro Leu
 85 90 95
 Ala Met Leu Ser Ser Ser Ala Leu Phe Asp His Ala Leu Phe Gly Glu
 100 105 110
 Val Ala Cys Arg Leu Tyr Leu Phe Leu Ser Val Cys Phe Val Ser Leu
 115 120 125
 Ala Ile Leu Ser Val Ser Ala Ile Asn Val Glu Arg Tyr Tyr Tyr Val
 130 135 140
 Val His Pro Met Arg Tyr Glu Val Arg Met Thr Leu Gly Leu Val Ala
 145 150 155 160
 Ser Val Leu Val Gly Val Trp Val Lys Ala Leu Ala Met Ala Ser Val
 165 170 175
 Pro Val Leu Gly Arg Val Ser Trp Glu Glu Gly Ala Pro Ser Val Pro
 180 185 190
 Pro Gly Cys Ser Leu Gln Trp Ser His Ser Ala Tyr Cys Gln Leu Phe
 195 200 205
 Val Val Val Phe Ala Val Leu Tyr Phe Leu Leu Pro Leu Leu Leu Ile
 210 215 220
 Leu Val Val Tyr Cys Ser Met Phe Arg Val Ala Arg Val Ala Ala Met
 225 230 235 240
 Gln His Gly Pro Leu Pro Thr Trp Met Glu Thr Pro Arg Gln Arg Ser
 245 250 255
 Glu Ser Leu Ser Ser Arg Ser Thr Met Val Thr Ser Ser Gly Ala Pro
 260 265 270
 Gln Thr Thr Pro His Arg Thr Phe Gly Gly Gly Lys Ala Ala Val Val
 275 280 285
 Leu Leu Ala Val Gly Gly Gln Phe Leu Leu Cys Trp Leu Pro Tyr Phe
 290 295 300
 Ser Phe His Leu Tyr Val Ala Leu Ser Ala Gln Pro Ile Ser Thr Gly
 305 310 315 320
 Gln Val Glu Ser Val Val Thr Trp Ile Gly Tyr Phe Cys Phe Thr Ser
 325 330 335
 Asn Pro Phe Phe Tyr Gly Cys Leu Asn Arg Gln Ile Arg Gly Glu Leu
 340 345 350

Ser Lys Gln Phe Val Cys Phe Phe Lys Pro Ala Pro Glu Glu Glu Leu
355 360 365

Arg Leu Pro Ser Arg Glu Gly Ser Ile Glu Glu Asn Phe Leu Gln Phe
370 375 380

Leu Gln Gly Thr Gly Cys Pro Ser Glu Ser Trp Val Ser Arg Pro Leu
385 390 395 400

Pro Ser Pro Lys Gln Glu Pro Pro Ala Val Asp Phe Arg Ile Pro Gly
405 410 415

Gln Ile Ala Glu Glu Thr Ser Glu Phe Leu Glu Gln Gln Leu Thr Ser
420 425 430

Asp Ile Ile Met Ser Asp Ser Tyr Leu Arg Pro Ala Ala Ser Pro Arg
435 440 445

Leu Glu Ser
450

<210> 19

<211> 321

<212> PRT

<213> Homo sapiens

<400> 19

Met Asn Gln Thr Leu Asn Ser Ser Gly Thr Val Glu Ser Ala Leu Asn
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Tyr Ser Arg Gly Ser Thr Val His Thr Ala Tyr Leu Val Leu Ser Ser
20 25 30

Leu Ala Met Phe Thr Cys Leu Cys Gly Met Ala Gly Asn Ser Met Val
35 40 45

Ile Trp Leu Leu Gly Phe Arg Met His Arg Asn Pro Phe Cys Ile Tyr
50 55 60

Ile Leu Asn Leu Ala Ala Ala Asp Leu Leu Phe Leu Phe Ser Met Ala
65 70 75 80

Ser Thr Leu Ser Leu Glu Thr Gln Pro Leu Val Asn Thr Thr Asp Lys
85 90 95

Val His Glu Leu Met Lys Arg Leu Met Tyr Phe Ala Tyr Thr Val Gly
100 105 110

Leu Ser Leu Leu Thr Ala Ile Ser Thr Gln Arg Cys Leu Ser Val Leu
115 120 125

Phe Pro Ile Trp Phe Lys Cys His Arg Pro Arg His Leu Ser Ala Trp
130 135 140

Val Cys Gly Leu Leu Trp Thr Leu Cys Leu Leu Met Asn Gly Leu Thr
 145 150 155 160

Ser Ser Phe Cys Ser Lys Phe Leu Lys Phe Asn Glu Asp Arg Cys Phe
 165 170 175

Arg Val Asp Met Val Gln Ala Ala Leu Ile Met Gly Val Leu Thr Pro
 180 185 190

Val Met Thr Leu Ser Ser Leu Thr Leu Phe Val Trp Val Arg Arg Ser
 195 200 205

Ser Gln Gln Trp Arg Arg Gln Pro Thr Arg Leu Phe Val Val Val Leu
 210 215 220

Ala Ser Val Leu Val Phe Leu Ile Cys Ser Leu Pro Leu Ser Ile Tyr
 225 230 235 240

Trp Phe Val Leu Tyr Trp Leu Ser Leu Pro Pro Glu Met Gln Val Leu
 245 250 255

Cys Phe Ser Leu Ser Arg Leu Ser Ser Ser Val Ser Ser Ser Ala Asn
 260 265 270

Pro Val Ile Tyr Phe Leu Val Gly Ser Arg Arg Ser His Arg Leu Pro
 275 280 285

Thr Arg Ser Leu Gly Thr Val Leu Gln Gln Ala Leu Arg Glu Glu Pro
 290 295 300

Glu Leu Glu Gly Gly Glu Thr Pro Thr Val Gly Thr Asn Glu Met Gly
 305 310 315 320

Ala

<210> 20
 <211> 333
 <212> PRT
 <213> Homo sapiens

<400> 20
 Met Glu Lys Val Asp Met Asn Thr Ser Gln Glu Gln Gly Leu Cys Gln
 1 5 10 15

Phe Ser Glu Lys Tyr Lys Gln Val Tyr Leu Ser Leu Ala Tyr Ser Ile
 20 25 30

Ile Phe Ile Leu Gly Leu Pro Leu Asn Gly Thr Val Leu Trp His Phe
 35 40 45

Trp Gly Gln Thr Lys Arg Trp Ser Cys Ala Thr Thr Tyr Leu Val Asn
 50 55 60

Leu Met Val Ala Asp Leu Leu Tyr Val Leu Leu Pro Phe Leu Ile Ile
 15

65		70		75		80
Thr Tyr Ser Leu Asp	Asp Arg Trp Pro Phe	Gly Glu Leu Leu Cys Lys				
	85	90			95	
Leu Val His Phe Leu Phe Tyr Ile Asn Leu Tyr Gly Ser Ile Leu Leu						
	100	105			110	
Leu Thr Cys Ile Ser Val His Gln Phe Leu Gly Val Cys His Pro Leu						
	115	120			125	
Cys Ser Leu Pro Tyr Arg Thr Arg Arg His Ala Trp Leu Gly Thr Ser						
	130	135			140	
Thr Thr Trp Ala Leu Val Val Leu Gln Leu Leu Pro Thr Leu Ala Phe						
	145	150			155	160
Ser His Thr Asp Tyr Ile Asn Gly Gln Met Ile Trp Tyr Asp Met Thr						
	165	170			175	
Ser Gln Glu Asn Phe Asp Arg Leu Phe Ala Tyr Gly Ile Val Leu Thr						
	180	185			190	
Leu Ser Gly Phe Leu Ser Leu Leu Gly His Phe Gly Val Leu Phe Thr						
	195	200			205	
Asp Gly Gln Glu Pro Asp Gln Ala Arg Gly Glu Pro His Glu Asp Arg						
	210	215			220	
Gln His Ser Pro Ser Gln Val His Pro Asp His Pro Thr Gly Val Trp						
	225	230			235	240
Pro Leu His Pro Leu Phe Cys Ala Leu Pro Tyr His Ser Leu Leu Leu						
	245	250			255	
Pro His His Leu Leu Ser Ala Phe Ser Gly Leu Pro Ala Leu Asp Gly						
	260	265			270	
Ser Gln Cys Gly Leu Gln Asp Met Glu Ala Ser Gly Glu Cys Glu Gln						
	275	280			285	
Leu Pro Gln Pro Ser Pro Val Leu Ser Phe Lys Gly Gly Lys Asn Arg						
	290	295			300	
Val Arg Leu Leu Gln Lys Leu Arg Gln Asn Lys Leu Gly Glu His Pro						
	305	310			315	320
Ala Gly Arg Lys Arg Cys Pro Gly Leu Asn Arg Ser Gly						
	325	330				

<210> 21

<211> 508

<212> PRT

<213> Homo sapiens

<400> 21

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Met Thr Ser Thr Cys Thr Asn Ser Thr Arg Glu Ser Asn Ser Ser His
 1          5          10          15

Thr Cys Met Pro Leu Ser Lys Met Pro Ile Ser Leu Ala His Gly Ile
          20          25          30

Ile Arg Ser Thr Val Leu Val Ile Phe Leu Ala Ala Ser Phe Val Gly
          35          40          45

Asn Ile Val Leu Ala Leu Val Leu Gln Arg Lys Pro Gln Leu Leu Gln
          50          55          60

Val Thr Asn Arg Phe Ile Phe Asn Leu Leu Val Thr Asp Leu Leu Gln
          65          70          75          80

Ile Ser Leu Val Ala Pro Trp Val Val Ala Thr Ser Val Pro Leu Phe
          85          90          95

Trp Pro Leu Asn Ser His Phe Cys Thr Ala Leu Val Ser Leu Thr His
          100          105          110

Leu Phe Ala Phe Ala Ser Val Asn Thr Ile Val Val Val Ser Val Asp
          115          120          125

Arg Tyr Leu Ser Ile Ile His Pro Leu Ser Tyr Pro Ser Lys Met Thr
          130          135          140

Gln Arg Arg Gly Tyr Leu Leu Leu Tyr Gly Thr Trp Ile Val Ala Ile
          145          150          155          160

Leu Gln Ser Thr Pro Pro Leu Tyr Gly Trp Gly Gln Ala Ala Phe Asp
          165          170          175

Glu Arg Asn Ala Leu Cys Ser Met Ile Trp Gly Ala Ser Pro Ser Tyr
          180          185          190

Thr Ile Leu Ser Val Val Ser Phe Ile Val Ile Pro Leu Ile Val Met
          195          200          205

Ile Ala Cys Tyr Ser Val Val Phe Cys Ala Ala Arg Arg Gln His Ala
          210          215          220

Leu Leu Tyr Asn Val Lys Arg His Ser Leu Glu Val Arg Val Lys Asp
          225          230          235          240

Cys Val Glu Asn Glu Asp Glu Glu Gly Ala Glu Lys Lys Glu Glu Phe
          245          250          255

Gln Asp Glu Ser Glu Phe Arg Arg Gln His Glu Gly Glu Val Lys Ala
          260          265          270

Lys Glu Gly Arg Met Glu Ala Lys Asp Gly Ser Leu Lys Ala Lys Glu
          275          280          285

Gly Ser Thr Gly Thr Ser Glu Ser Ser Val Glu Ala Arg Gly Ser Glu

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290		295		300
Glu Val Arg Glu Ser Ser Thr Val Ala Ser Asp Gly Ser Met Glu Gly				
305		310		315 320
Lys Glu Gly Ser Thr Lys Val Glu Glu Asn Ser Met Lys Ala Asp Lys				
		325		330 335
Gly Arg Thr Glu Val Asn Gln Cys Ser Ile Asp Leu Gly Glu Asp Asp				
		340		345 350
Met Glu Phe Gly Glu Asp Asp Ile Asn Phe Ser Glu Asp Asp Val Glu				
		355		360 365
Ala Val Asn Ile Pro Glu Ser Leu Pro Pro Ser Arg Arg Asn Ser Asn				
		370		375 380
Ser Asn Pro Pro Leu Pro Arg Cys Tyr Gln Cys Lys Ala Ala Lys Val				
385		390		395 400
Ile Phe Ile Ile Ile Phe Ser Tyr Val Leu Ser Leu Gly Pro Tyr Cys				
		405		410 415
Phe Leu Ala Val Leu Ala Val Trp Val Asp Val Glu Thr Gln Val Pro				
		420		425 430
Gln Trp Val Ile Thr Ile Ile Ile Trp Leu Phe Phe Leu Gln Cys Cys				
		435		440 445
Ile His Pro Tyr Val Tyr Gly Tyr Met His Lys Thr Ile Lys Lys Glu				
		450		455 460
Ile Gln Asp Met Leu Lys Lys Phe Phe Cys Lys Glu Lys Pro Pro Lys				
465		470		475 480
Glu Asp Ser His Pro Asp Leu Pro Gly Thr Glu Gly Gly Thr Glu Gly				
		485		490 495
Lys Ile Val Pro Ser Tyr Asp Ser Ala Thr Phe Pro				
		500		505

<210> 22

<211> 1305

<212> DNA

<213> Homo sapiens

<400> 22

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atggaggatc tcttttagccc ctcaattctg cgcgcggcgc ccaacatttc cgtgcccac 60
ttgtggggct ggggtctcaa cctgaccttg gggcaaggag cccctgcctc tgggcccggc 120
agccgccgcg tccgcctggt gttcctgggg gtcaccttg tggtagcggt ggcaggcaac 180
accacagtgc tgtgccgcct gtgcggcggc ggcggggccct gggcgggccc caagcgctgc 240
aagatggact tcctgctggt gcagctggcc ctggcgggacc tgtacgcgtg cggggggcacg 300
gcgctgtcac agctggcctg ggaactgctg ggcgagcccc gcgcggccac gggggacctg 360
gcgtgccgct tcctgcagct gctgcaggca tccgggcggg gcgcctcggc ccacctcgtg 420
gtgctcatcg cctcgcagcg ccggcgcgcg gtgcgtcttc cgcacggccg gccgctgccc 480

```

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gcgcgtgccc tcgcgcgcct gggctggctg ctggcactgc tgctggcgt gccccggcc 540
ttcgtggtgc gcggggactc cccctcgccg ctgcccgcgc cgccgcgcgc aacgtccctg 600
cagccaggcg cgcgcccgcc cgcgcgcgc tgcccggggc agcgtcgctg ccacgggatc 660
ttcgcgcccc tgccgcgctg gcacctgcag gtctacgctg tctacgaggc cgtcgcgggc 720
ttcgtcgcgc ctgttacggc cctgggctgc gcttgccggc acctactctc cgtctggttg 780
cggcaccggc cgcaggcccc cgcggctgca gcgccttgt cggcgagccc aggtcgagcc 840
cctgcgcccc gcgcgctgcc ccgcgcgaag gtgcagagcc tgaagatgag cctgctgctg 900
gcgctgctgt tcgtgggctg cgagctgccc tactttgccc cccggctggc ggccgcgttg 960
tcgtccgggc ccgcgggaga ctgggagggg gagggcctgt cggcggcgtg gcgcgtggtg 1020
gcgatggcca acagcgtct caatcccttc gtctacctct tcttcaggc ggcgactgc 1080
cggctccggc gacagctgcg gaagcggctg ggctctctgt gctgcgcgcc gcaggaggc 1140
gcggaggacg aggagggggc ccggggccac caggcgtctt accgccaacg ctggccccac 1200
cctcattatc accatgctcg gcgggaaccg ctggacgagg gcggttgcg cccacccccct 1260
ccgcgcccc aacccctgcc ttgctcctgc gaaagtgcct tctag 1305

```

<210> 23

<211> 1356

<212> DNA

<213> Homo sapiens

<400> 23

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atggagtcct caccatccc ccagtcatca gggaaactct ccactttggg gagggtcct 60
caaacccag gtccctctac tgccagtggg gtcccggagg tggggctacg ggatgttgct 120
tcggaatctg tggccctctt cttcatgctc ctgtggact tgactgctgt ggtggcaat 180
gccgctgtga tggcgtgat cgccaagacg cctgccctcc gaaaatttgt cttcgtcttc 240
cacctctgcc tgggtggacct gctggctgcc ctgacctca tgcccctggc catgctctcc 300
agctctgccc tctttgacca cgccctcttt ggggaggtgg cctgccgcct ctacttgttt 360
ctgagcgtgt gctttgtcag cctggccatc ctctcggtgt cagccatcaa tgtggagcgc 420
tactattacg tagtccaccc catgcgctac gaggtgcgca tgacgctggg gctggtggcc 480
tctgtgctgg tgggtgtgtg ggtgaaggcc ttggccatgg cttctgtgcc agtgttgga 540
aggtctctct gggaggaagg agctcccag gtccccag gctgttact ccagtggagc 600
cacagtgcct actgccagct tttgtgggt gtctttgctg tctttactt tctgttgccc 660
ctgctcctca tacttgttgt ctactgcagc atgttccgag tggcccgct ggctgccatg 720
cagcacgggc cgctgccac gtggatggag acacccggc aacgtccga atctctcagc 780
agccgctcca cgatggtcac cagctcgggg gcccccaga ccacccaca ccggacgttt 840
gggggagggg aagcagcagt ggttctcctg gctgtggggg gacagttcct gctctgttg 900
ttgccctact tctctttcca cctctatgtt gccctgagtg ctcagcccat ttcaactggg 960
caggtggaga gtgtggtcac ctggattggc tacttttgct tctttccaa ccctttcttc 1020
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aagccagctc cagaggagga gctgaggctg cctagccggg agggctccat tgaggagaa 1140
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cccagcccca agcaggagcc acctgctgtt gactttcgaa tccaggcca gatagctgag 1260
gagacctctg agttcctgga gcagcaactc accagcgaca tcatcatgtc agacagctac 1320
ctccgtcctg ccgcctcacc ccggctggag tcatga 1356

```

<210> 24

<211> 966

<212> DNA

<213> Homo sapiens

<400> 24

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atgaaccaga ctttgaatag cagtgggacc gtggagtcag ccctaaacta ttccagaggg 60
agcacagtgc acacggccta cctgggtgct agctccctgg ccatgttcac ctgcctgtgc 120
gggatggcag gcaacagcat ggtgatctgg ctgctgggct ttcgaatgca caggaaaccc 180

```

```

ttctgcatct atatcctcaa cctggcggca gccgacctcc tcttcctctt cagcatggct 240
tccacgctca gcctggaaac ccagcccctg gtcaatacca ctgacaaggt ccacgagctg 300
atgaagagac tgatgtactt tgcctacaca gtgggcctga gcctgctgac ggccatcagc 360
accacgcgct gtctctctgt cctcttcctt atctggttca agtgtcaccg gccacggcac 420
ctgtcagcct ggggtgtgtg cctgctgtgg acactctgtc tcctgatgaa cgggttgacc 480
tcttccttct gcagcaagtt cttgaaattc aatgaagatc ggtgcttcag ggtggacatg 540
gtccaggccg ccctcatcat gggggtctta accccagtga tgactctgtc cagcctgacc 600
ctctttgtct ggggtgcggag gagctcccag cagtggcggc ggagcccac acggctgttc 660
gtgggtggtec tggcctctgt cctgggtgtc ctcactctgt ccctgcctct gagcatctac 720
tggtttgtgc tctactgggt gagcctgccg ccgagatgc aggtcctgtg cttcagcttg 780
tcacgcctct cctcgtccgt aagcagcagc gccaaacccg tcatctactt cctgggtggc 840
agccggagga gccacaggct gccaccagg tccttgggga ctgtgtcca acaggcgtt 900
cgcgaggagc ccgagctgga aggtggggag acgcccaccg tgggcaccaa tgagatgggg 960
gcttga

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<210> 25

<211> 1002

<212> DNA

<213> Homo sapiens

<400> 25

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atggagaagg tggacatgaa tacatcacag gaacaaggct tctgccagtt ctgagagaag 60
tacaagcaag tctacctctc cctggcctac agtatcatct ttatcctagg gctgccacta 120
aatggcactg tcttgtggca cttctggggc caaaccaagc gctggagctg tgccaccacc 180
tatctggtga acctgatggt ggccgacctg ctttatgtgc tattgccctt cctcatcatc 240
acctactcac tagatgacag gtggcccttc ggggagctgc tctgcaagct ggtgcacttc 300
ctgtttctata tcaaccttta cggcagcatc ctgctgctga cctgcatctc tgtgcaccag 360
ttcctagggtg tgtgccaccc actgtgttcg ctgccctacc ggaccgcag gcatgcctgg 420
ctgggcacca gcaccacctg ggccctgggt gtccctccagc tgctgcccac actggccttc 480
tcccacacgg actacatcaa tggccagatg atctgggtatg acatgaccag ccaagagaat 540
tttgatggcg tttttgccca cggcatagtt ctgacattgt ctggctttct ttccctcctt 600
ggtcattttg gtgtgctatt cactgatggt caggagcctg atcaagccag aggagaacct 660
catgaggaca ggcaacacag cccgagccag gtccatccgg accatcctac tgggtgtgtg 720
cctcttcacc ctctgttttg tgcccttcca tatcactcgc tccttctacc tcaccatctg 780
ctttctgctt tctcaggact gccagctcct gatggcagcc agtgtggcct acaagatatg 840
gaggcctctg gtgagtgtga gcagctgcct caaccagtc ctgtactttc tttcaagggg 900
ggcaaaaata gagtcaggct cctccagaaa ctgaggcaga acaagttggg tgagcatcca 960
gctgggagga agagatgccc agggttgaac agatctgggt aa 1002

```

<210> 26

<211> 1527

<212> DNA

<213> Homo sapiens

<400> 26

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atgacgtcca cctgcaccaa cagcacgcgc gagagtaaca gcagccacac gtgcatgccc 60
ctctccaaaa tgcccatcag cctggccccc ggcatcatcc gctcaaccgt gctggttatc 120
ttcctcgccg cctctttcgt cggcaacata gtgctggcgc tagtgttgca gcgcaagccg 180
cagctgctgc aggtgaccaa ccgttttatc tttaacctcc tcgtcaccga cctgctgcag 240
atttcgctcg tggccccctg ggtgggtggc acctctgtgc ctctcttctg gcccctcaac 300
agccacttct gcacggccct ggtagcctc acccactgt tcgccttcgc cagcgtcaac 360
accattgtct tgggtgcagt ggatcgctac ttgtccatca tccacctct ctctacccg 420
tccaagatga ccagcgccg cggttacctg ctctctatg gcacctggat tgtggccatc 480
ctgcagagca ctccctccact ctacggctgg ggccaggctg cctttgatga gcgcaatgct 540

```

```

ctctgctcca tgatctgggg ggccagcccc agctacacta ttctcagcgt ggtgtccttc 600
atcgtcattc cactgattgt catgattgcc tgctactccg tgggtgttctg tgcagcccgg 660
aggcagcatg ctctgctgta caatgtcaag agacacagct tgggaagtgcg agtcaaggac 720
tgtgtggaga atgaggatga agagggagca gagaagaagg aggagttcca ggatgagagt 780
gagtttcgcc gccagcatga aggtgaggtc aaggccaagg agggcagaat ggaagccaag 840
gacggcagcc tgaaggccaa ggaagggaagc acggggacca gtgagagtag tgtagaggcc 900
aggggcagcg aggaggtcag agagagcagc acgggtggcca gcgacggcag catggagggg 960
aaggaaggca gcaccaaagt tgaggagaac agcatgaagg cagacaaggg tcgcacagag 1020
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aatttcagtg aggatgacgt cgaggcagtg aacatcccgg agagcctccc acccagtcgt 1140
cgtaacagca acagcaaccc tcctctgccc aggtgctacc agtgcaaagc tgctaaagtg 1200
atcttcatca tcattttctc ctatgtgcta tccttggggc cctactgctt tttagcagtc 1260
ctggccgtgt ggggtggatgt cgaaacccag gtaccccagt ggggtgatcac cataatcatc 1320
tggcttttct tcctgcagtg ctgcatccac ccctatgtct atggctacat gcacaagacc 1380
attaagaagg aaatccagga catgctgaag aagttcttct gcaaggaaaa gccccgaaa 1440
gaagatagcc acccagacct gcccggaaca gaggggtggga ctgaaggcaa gattgtccct 1500
tcctacgatt ctgctacttt tccttga 1527

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<210> 27

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 27

atggaggatc tcttttagccc ctcaattc

28

<210> 28

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 28

ctagaaggca ctttcgcagg agcaaggc

28

<210> 29

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 29

atggagtcct caccatccc ccagtcac

29

<210> 30
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 30
 tcatgactcc agccggggtg aggcggcag 29

<210> 31
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 31
 atgaaccaga ctttgaatag cagtgg 26

<210> 32
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 32
 tcaagcccc atctcattgg tgcccacg 28

<210> 33
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 33
 atggagaagg tggacatgaa tacatcac 28

<210> 34
 <211> 29

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 34
 ttaccagat ctgttcaacc ctgggcac 29

<210> 35
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 35
 atgacgtcca cctgcaccaa cagcacgc 28

<210> 36
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 36
 tcaaggaaaa gtagcagaat cgtaggaag 29

<210> 37
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 37
 ccaggagcgt ttctatgcct 20

<210> 38
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 38

tgtgatcttt gctccctgca

20

<210> 39

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized TaqMan probe sequence

<220>

<221> misc_binding

<222> (1)

<223> Label FAM (6-carboxy-fluorescein)

<220>

<221> misc_binding

<222> (28)

<223> Label TAMRA
(6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 39

tcagaacctg ccagcattga atagtgcc

28

<210> 40

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 40

atctgctttg ccccgatatgt

20

<210> 41

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 41

accgccttgc tgtaggtcag

20

<210> 42
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized TaqMan probe sequence

<220>
 <221> misc_binding
 <222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

<220>
 <221> misc_binding
 <222> (22)
 <223> Label TAMRA
 (6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 42
 tcgtgccctt cgtcaccgtg aa 22

<210> 43
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 43
 cccagcatcc ataccagaaa a 21

<210> 44
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 44
 ctgtgtccct ctcattgcaa a 21

<210> 45
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized TaqMan probe sequence

<220>
 <221> misc_binding
 <222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

<220>
 <221> misc_binding
 <222> (28)
 <223> Label TAMRA
 (6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 45
 tgagaaggca gagattccca tccttcct 28

<210> 46
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 46
 tcgccatgag caacagcat 19

<210> 47
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 47
 cactggactt accgccattg t 21

<210> 48
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized TaqMan probe sequence

<220>
 <221> misc_binding

<222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

 <220>
 <221> misc_binding
 <222> (29)
 <223> Label TAMRA
 (6-carboxy-N,N,N',N'-tetramethylrhodamine)

 <400> 48
 agatcatgtt gctccactgg aaggcttct 29

 <210> 49
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

 <400> 49
 ggatctctttt agccctcaa ttc 23

 <210> 50
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

 <400> 50
 aaggtcaggt tgagaccca g 21

 <210> 51
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:an artificially
 synthesized TaqMan probe sequence

 <220>
 <221> misc_binding
 <222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

 <220>
 <221> misc_binding
 <222> (25)

<223> Label TAMRA
(6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 51
aacatttccg tgcccatctt gctgg 25

<210> 52
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:an artificially
synthesized primer sequence

<400> 52
gctgttgact ttcgaatccc a 21

<210> 53
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:an artificially
synthesized primer sequence

<400> 53
acggaggtag ctgtctgaca tga 23

<210> 54
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:an artificially
synthesized TaqMan probe sequence

<220>
<221> misc_binding
<222> (1)
<223> Label FAM (6-carboxy-fluorescein)

<220>
<221> misc_binding
<222> (26)
<223> Label TAMRA
(6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 54
tgagttcctg gagcagcaac tcacca 26

<210> 55
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 55
 ggcttttcgaa tgcacaggaa 20

<210> 56
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 56
 ggaagccatg ctgaagagga 20

<210> 57
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
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 synthesized TaqMan probe sequence

<220>
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 <222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

<220>
 <221> misc_binding
 <222> (28)
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 (6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 57
 ttctgcatct atatcctcaa cctggcgg 28

<210> 58
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 58

tggcctcttc accctctgtt t

21

<210> 59

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 59

atcaagagct ggcagtcctg a

21

<210> 60

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized TaqMan probe sequence

<220>

<221> misc_binding

<222> (1)

<223> Label FAM (6-carboxy-fluorescein)

<220>

<221> misc_binding

<222> (30)

<223> Label TAMRA
(6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 60

tccatatcac tcgctccttc tacctcacca

30

<210> 61

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:an artificially synthesized primer sequence

<400> 61

cctaaatgcc catcagcct

19

<210> 62
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized primer sequence

<400> 62
 gcactatgtt gccgacgaaa

20

<210> 63
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:an artificially
 synthesized TaqMan probe sequence

<220>
 <221> misc_binding
 <222> (1)
 <223> Label FAM (6-carboxy-fluorescein)

<220>
 <221> misc_binding
 <222> (26)
 <223> Label TAMRA
 (6-carboxy-N,N,N',N'-tetramethylrhodamine)

<400> 63
 catccgctca accgtgctgg ttatct

26